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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/698,168	10/30/2000	Kosuke Inoue	500.39241X00	5655

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EXAMINER

NGUYEN, DILINH P

ART UNIT PAPER NUMBER

2814

DATE MAILED: 01/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/698,168

Applicant(s)

INOUE ET AL.

Examiner

DiLinh Nguyen

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 12 and 23-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12 and 23-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 October 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,6-7,10.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Specification*

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The disclosure is objected to because of the following informalities:

In page 1, line 4, what is the present application is related to application serial number?

In page 1, line 11, what is the application serial number?

Appropriate correction is required.

### *Title*

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### *Drawings*

~~Figures 31 and 32 should be designated by a legend such as --Prior Art--~~  
because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

New corrected drawings are required in this application because the drawings contain foreign characters. Applicant is advised to employ the services of a competent

patent drafts person outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimoishizaka et al. (U.S. Pat. 6313532) in view of Kambe et al. (U.S. Pat. 6323439).

Shimoishizaka et al. disclose a semiconductor apparatus (figs. 1-6) comprising:

a semiconductor device 10;

an electrically insulating layer 20 (column 6, lines 6-8) formed on the semiconductor device and having a thickness in range of from 35 to 150 micrometers (column 7, lines 5-6);

an external connection terminal 40 formed on the electrically insulating layer; and  
a wiring 31 for electrically connecting the external connection terminal to a circuit electrode 11 of the semiconductor device.

Shimoishizaka et al. fail to disclose the wiring is constituted by a copper wire and a nickel layer formed on the copper wire.

Kambe et al. disclose a semiconductor device (cover fig.) comprising: a wiring layer forming a double structure comprising a copper layer and a nickel layer (column 4, lines 60-65). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Shimoishizaka et al. to increase the electrical connection of the wiring layer, as shown by Kambe et al.

3. Claims 23-28 and 32 are rejected under 35 U.S.C. 102(e) as being anticipated by Shimoishizaka et al. (U.S. Pat. 6313532) in view of Kambe et al. (U.S. Pat. 6323439).

Shimoishizaka et al. disclose a semiconductor apparatus (figs. 1-6) comprising:  
a semiconductor device 10 (cover fig.)

an electrically insulating layer 20 (column 6, lines 6-8) formed on the semiconductor device;

an external connection terminal 40 formed on the electrically insulating layer; and

a wiring 31 formed on the electrically insulating layer and provided to electrically connect a circuit electrode 11 of the semiconductor device and the external connection terminal,

wherein the electrically insulating layer serves to relax a stress produced between the semiconductor apparatus and a substrate 10 on which the semiconductor apparatus is mounted (column 6, lines 57-64).

Shimoishizaka et al. fail to disclose the wiring is constituted by a copper wire and a nickel layer formed on the copper wire.

Kambe et al. disclose a semiconductor device (cover fig.) comprising: a wiring layer forming a double structure comprising a copper layer and a nickel layer (column 4,

lines 60-65). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Shimoishizaka et al. to increase the electrical connection of the wiring layer, as shown by Kambe et al.

- Regarding claim 25, Kamble et al. disclose the wiring is in a two layered structure having the copper and nickel layers, and the nickel layer covers the copper layer.

The process limitations "each of said copper layer and said nickel layer being formed by electroplating" in claim 25, do not carry weight in a claim drawn to structure.

In re Thorpe, 277 USPQ 964 (Fed. Cir. 1985).

- Regarding claim 26, Kamble et al. disclose the wiring is in a two layered structure having the copper and nickel layers and the material or structure of the wiring layer is selecting because of its electrical conductivity or adhesion with the insulating resin layer. Therefore, the copper layer is deformed subject to deformation of the electrically insulating layer, the nickel layer serves to restore the copper layer to its original shape before deformation.

- Regarding claim 27, Shimoishizaka et al. disclose the wiring has one end serving also as a bump pad.

- Regarding claims 24 and 28, these claims considered a product-by-process limitations. "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was

made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

- Regarding claim 32, Shimoishizaka et al. disclose the wiring has its width increased on an edge portion of the electrically insulating layer.

4. Claim 29 is rejected under 35 U.S.C. 102(e) as being anticipated by Shimoishizaka et al. (U.S. Pat. 6313532) in view of Kambe et al. (U.S. Pat. 6323439) and further in view of Yokota et al. (JP Pat. 363200415).

Shimoishizaka et al. and Kambe et al. fail to disclose the insulating layer contains particles.

Yokota et al. disclose an insulating layer contains particles (abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Shimoishizaka et al. and Kambe et al. to improve electric insulating capability and thermal stability of a superconductive wire material by distributing particles in an insulating layer, as shown by Yokota et al.

5. Claims 33-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Shimoishizaka et al. (U.S. Pat. 6313532) in view of Kambe et al. (U.S. Pat. 6323439) and further in view of Iwatsu et al. (U.S. Pat. 6425516).

Shimoishizaka et al. disclose the external connection terminal has an external connection terminal member formed on a flat portion of the electrically insulating layer having a substantially constant thickness and a contact angle formed between the external connection terminal member and the electrically insulating layer.

Shimoishizaka et al. and Kambe et al. fail to disclose an external connection terminal member formed on an inclination portion of the electrically insulating layer.

Iwatsu et al. disclose a semiconductor device comprising : an external connection terminal member formed on an inclination portion on a substrate 1; a contact angle formed between the external connection terminal member and the substrate 1, and wherein the contact angle formed on a flat portion is smaller than a contact angle formed on an inclination portion (fig. 6). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Shimoishizaka et al. and Kambe et al. to provide a different of expansion, difference amounts of contraction for the semiconductor package devices, as shown by Iwatsu et al.

6. Claims 30-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Shimoishizaka et al. (U.S. Pat. 6313532) in view of Kambe et al. (U.S. Pat. 6323439) and further in view of Kameda et al. (U.S. Pat. 6130484).

Shimoishizaka et al. disclose the electrically insulating layer has an inclination portion, a power/ground line and signal line in the wiring on the inclination portion of the electrically insulating layer.

However, Shimoishizaka et al. and Kambe et al. fail to disclose the power/ground line has a shape different and a width larger than that of the signal line.

Kameda et al. disclose a semiconductor device comprising : the wirings include a signal line, power/ground line and wherein the power/ground line has a shape different and a width larger than that of the wirings as the signal line (fig. 7, column 1, lines 30-



35). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Shimoishizaka et al. and Kambe et al. to ensure reliability against electromigration other like by increasing the width of the power/ground line, as shown by Kameda et al.

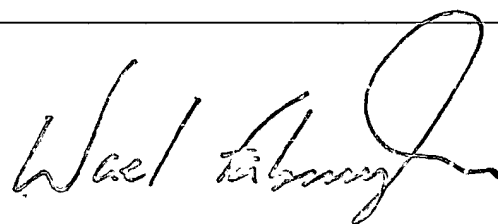
**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (703) 305-6983. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

DLN  
January 24, 2003

A handwritten signature in black ink, appearing to read 'Wael Fahmy', is written over a horizontal line.

SUPERVISORY PRIMARY EXAMINER  
TECHNOLOGY CENTER 2800